

WHAT IS CLAIMED IS:

1. A Soller slit device for collimating high energy radiation comprising:
a plurality of substantially parallel blades constructed from a material
5 having a density less than 6 g/cm³ and operative to transmit high energy radiation parallel to the blades and to absorb divergent radiation.
2. The Soller slit device of claim 1, wherein said material has a density less than 5 g/cm³.
3. The Soller slit device of claim 2, wherein the blades are made
10 from glass.
4. The Soller slit device of claim 2, wherein the blades are made of mica.
5. The Soller slit device of claim 1 wherein said device transmits at least 60% of incident high-energy radiation.
- 15 6. The Soller slit device of claim 5, wherein the transmission efficiency is in the range of 60-80%.
7. The Soller slit device of claim 1, wherein the length of each blade in the direction of transmission is greater than 5 cm.
8. The Soller slit device of claim 7, wherein the blade length is at
20 least 12 cm.

9. The Soller slit device of claim 8, wherein the blade length is in the range of 12-15 cm.

10. The Soller slit device of claim 1, wherein the thickness of each blade is no greater than 70 μm .

5 11. The Soller slit device of claim 10, wherein the thickness of each blade is approximately 50 μm .

12. The Soller slit device of claim 1, wherein the surface of each of the blades is non-reflective to high energy radiation.

10 13. The Soller slit device of claim 12, wherein the surface of each of the blades is non-reflective to X-rays.

14. The Soller slit device of claim 12, wherein the blades each have a non-reflective coating.

15 15. The Soller slit device of claim 12, wherein the surface of each of the blades is etched to prevent reflection.

16. A system for performing high energy radiation diffractometry, comprising:

a high energy radiation source;

a high energy radiation collimating device; and

20 a device for collecting high energy radiation after the high energy radiation impinges on a sample to be examined;

wherein the high energy collimating device has a divergence angle of less than 0.1° and a transmission efficiency of at least 60%.

17. The diffractometry system of claim 16, wherein the high energy radiation comprises X-ray radiation.

18. The diffractometry system of claim 16, wherein the high energy radiation comprises extreme ultraviolet (EUV) radiation.

5 19. The diffractometry system of claim 16, wherein the high energy radiation collimating device comprises a Soller slit device.

20. The diffractometry system of claim 19, wherein the Soller slit device has blades made from a material having a density no greater than 6 g/cm^3 .

10 21. The diffractometry system of claim 20, wherein said material comprises glass.

22. The diffractometry system of claim 20, wherein said material comprises mica.